# DDP.03 Clear zone and guardrail length of need.xls
## Length of Need Calculations(X)

X alignment

**Enter Values for Equations found in Chapter 1610 of the Design Manual and field conditions encountered.**

| | | | |
|---|---|---|---|
| LH1= | 65.66 | L5= | |
| LH2= | | Y= | |
| L1= | | LR= | 110 |
| L2= | 10.58 | F= | |
| L4= | | | |

$$X1 = \frac{LH1 - (L2+Y)}{(LH1/LR)}$$

$$X1 = \frac{65.66-(10.58+)}{(65.66/110)}$$

$$X1 = \frac{55.08}{0.596909091}$$

**X1= 92.28**

**Adjacent-Side Hazard**
**Barrier Parallel to Roadway**

$$X2 = \frac{LH2 - (L5+Y)}{(LH2/LR)}$$

$$X2 = \frac{-(+)}{(/110)}$$

$$X2 = \frac{0}{0}$$

**X2= #DIV/0!**

**Opposite-Side Hazard**
**Barrier Parallel to Roadway**

$$X1 = \frac{LH1 - (L2+Y)}{(1/F)+(LH1/LR)}$$

$$X1 = \frac{65.66-(10.58+)}{(1/)+(65.66/110)}$$

$$X1 = \frac{55.08}{\#DIV/0!}$$

**X1= #DIV/0!**

**Adjacent-Side Hazard**

$$X2 = \frac{LH2 - (L5+Y)}{(1/F)+(LH2/LR)}$$

$$X2 = \frac{-(+)}{(1/)+(/110)}$$

$$X2 = \frac{0}{\#DIV/0!}$$

**X2= #DIV/0!**

**Opposite-Side Hazard**

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## Length of Need Calculations(X)

### Barrier Flare Begins at Hazard

$$X1 = \frac{(LH1+L1/F) - (L2+Y)}{(1/F)+(LH1/LR)}$$

$$X1 = \frac{(65.66+/)-(10.58+)}{(1/)+(65.66/110)}$$

$$X1 = \frac{\#DIV/0!}{\#DIV/0!}$$

**X1= #DIV/0!**

### Barrier Flare Begins at Hazard

$$X2 = \frac{(LH2+L4/F) - (L5+Y)}{(1/F)+(LH2/LR)}$$

$$X2 = \frac{(+/)-(+)}{(1/)+(/110)}$$

$$X2 = \frac{\#DIV/0!}{\#DIV/0!}$$

**X2= #DIV/0!**

### Adjacent-Side Hazard
### Barrier Flare Begins Before Hazard

### Opposite-Side Hazard
### Barrier Flare Begins Before Hazard

# DDP.03 Clear zone and guardrail length of need.xls
## Length of Need Calculations(X)

LOCATION: Power pole right where X on ramp starts.

| | | | | | |
|---|---|---|---|---|---|
| **ALIGNMENT** | **x** | LH1= | 65.66 | L5= | |
| **STATION** | **298+00.94** | LH2= | | Y= | |
| | | L1= | | LR= | 110 |
| X1= | LH1 -(L2+Y) | L2= | 10.58 | F= | |
| | (LH1/LR) | L4= | | | |

X1= 65.66-(10.58+)
(65.66/110)

X1= 55.08
0.596909091

**X1= 92.28**

LOCATION: Existing 2:1 slope on Rt of M line before X line begins
2:1 slope begins 10-ft off of edge of traveled way
10-ft is the clear zone requirement for the posted speed of 35 mph
Guardrail not warranted for the slope
Only for the power pole above

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